

REMARKS

Claims 1 and 4-18 are pending. By this amendment, claim 1 is amended, and claims 2 and 3 have been previously canceled without prejudice or disclaimer.

The amendment made to claim 1 does not add new matter and is fully supported by the specification. Support for the amendment may be found at least in Figure(s) 1-11 and at pages 6-14 of the specification. Consequently, Applicants respectfully request reconsideration and timely withdrawal of the pending objections and rejections for the reasons discussed below.

Objection to Claims

In the Office Action, claim 1 was objected to. This objection has been overcome by amending claim 1 to substitute “traverse” for “transverse.” This amendment is made for the sole purpose of correcting a typographical error, and is not made for the purpose of avoiding prior art or narrowing the claimed invention. Thus, no change in claim scope is intended.

Applicants respectfully submit that claim 1 as amended, overcomes the stated objection; and respectfully request that the objection be withdrawn.

35 U.S.C. § 102 Rejection

Claims 1, 4, and 12-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,940,716 issued to Jin, *et al.* (“Jin”). Applicants respectfully traverse this rejection for at least the following reasons.

In order for a rejection under 35 U.S.C. § 102(b) to be proper, a single reference must disclose every claimed feature. To be patentable, a claim need only recite a single novel feature

that is not disclosed in the cited reference. Thus, the failure of a cited reference to disclose one or more claimed features renders the 35 U.S.C. § 102(b) rejection improper.

As amended, claim 1 recites, in pertinent part:

... and wherein one of the at least one overhang is selectively configured *to prevent oxidation induced stress in a direction parallel to or transverse to a direction of a current flow.*

Nothing in Jin teaches an overhang that is *configured to prevent oxidation induced stress.*

Contrary to the present invention, Jin discloses the use of trench isolation regions that can be formed having a reduced *susceptibility to edge defects* because the periphery of the trench at the face of the substrate is covered by the electrically insulating material (see abstract).

The Examiner asserts that Jin discloses a configuration to prevent oxidation in column 2, lines 10-22; column 4, lines 10-13; and column 5, lines 10-21. However, column 2, lines 10-22 addresses the problems in area "A" of the prior art device. The column 4, lines 10-13, portion of Jin is directed to a protective layer 102 which is a stress buffer (not related to oxidation). Finally, column 5, lines 10-21, is directed to the mask removal (104B and 102A). None of the specific sections of Jin indicated by the Examiner disclose or even suggest a configuration to prevent oxidation as recited by claim 1.

The present invention is directed to overcoming, as explained in a pertinent part of Applicant's specification:

Oxidation induced stresses, which might otherwise degrade performance, may be suppressed by the overhang. A CMOS circuit comprising an nFET may have STI structures with overhangs in the direction parallel to the direction of current flow and in the direction transverse to current flow to prevent oxidation

of Si along the Si-SiO₂ interfaces. In contrast, a pFET device may have an overhang in the transverse direction, but no overhang in the direction parallel to the direction of current flow in accordance with Figure 4.¹

In this regard, there is no teaching or suggestion to prevent oxidation induced stress in a direction parallel to or *transverse to a direction of a current flow* in Jin. The Jin components are merely formed to have reduced susceptibility to edge defects because the periphery of the trench at the face of the substrate is covered by the electrically insulating region (column 4, lines 20-24).

Moreover, Jin does not teach or suggest an overhang that is configured in relation to a direction of current flow. In fact, currents is addressed *only once* in Jin – at col. 2, line 20, where stress-induced “leakage currents” are mentioned as contributing to the deterioration of electrical devices formed in active regions adjacent a conventional isolation trench. However, other than providing the features therein, Jin does not disclose the presently claimed invention.

Because Jin fails to teach an overhang configured to prevent oxidation induced stress and which is parallel to or transverse to a direction of current flow as claimed, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(b) rejection of claim 1. The withdrawal of the rejection of claims 4 and 12-14 is also requested because they depend from claim 1 and are allowable for at least the same reasons as claim 1, as well as for their added features. Since none of the prior art of record discloses or suggests all the features of the claimed invention,

¹ Pages 9 and 10

- 10 -

Applicants respectfully submit that independent claim 1, and all the claims that depend therefrom are in condition for allowance.

35 U.S.C. § 103 Rejection

Claims 5-11, and 15-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Jin in view of U. S. Patent No. 6,583,060 issued to Trivedi, *et al.* (“Trivedi”). Applicants respectfully traverse this rejection for the following reasons.

A rejection under 35 U.S.C. § 103(a) requires the Examiner to first establish a prima facie case of obviousness: “The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness.” M.P.E.P. § 2142. The Court of Appeals for the Federal Circuit has set forth three elements which must be shown for prima facie obviousness, set forth in a previous response to the instant application.

The rejection of claims 2, 3, 5-11, and 15-18 is improper because the teachings of Trivedi fails to cure the deficiencies of Jin, which were previously described above.

The Examiner cites Trivedi for the disclosure of a semiconductor substrate having p-channel and n-channel field effect transistors formed thereon. The Examiner suggests it would have been obvious to combine the teachings of Jin and Trivedi. However, neither Trivedi nor Jin, alone or in combination, teach or suggest configuring an overhang parallel to or traverse to a direction of current flow, to prevent oxidation induced stress in such directions. Thus, even if a motivation to combine these references existed, the resultant combination would not teach or disclose the novel elements recited in claim 1, from which claims 2, 3, 5-11, and 15-18 depend.

Accordingly, claims 5-11 and 15-18 are thus distinguishable over the references of record for at least the same reasons as claim 1, as well as for their added features. Consequently, all claims are in condition for allowance, and Applicants respectfully request that the rejection of claims 5-11 and 15-18 be withdrawn.

Entry of the Present Amendment

Pursuant to MPEP §714.13, Applicants contend that entry of the present amendment is appropriate because the proposed amended claims avoid the objections set forth in the last Office Action, resulting in the application being placed in condition for allowance, or, alternatively, the revised claims place the application in better condition for purposes of appeal. Furthermore, the revised claims do not present any new issues that would require any further consideration and/or search by the Examiner, and the amendment does not present any additional claims without cancelling a like number of pending claims. In particular, the present amendment merely corrects a minor typographical error. Accordingly, entry of the present amendment is respectfully requested.

- 12 -

CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to **IBM Deposit Account No. 09-0458** (Fishkill).

Respectfully submitted,



Andrew M. Calderon
Reg. No. 38,093

McGuireWoods LLP
1750 Tysons Boulevard
Suite 1800
McLean, VA 22102-4215
Tel: 703-712-5426
Fax: 703-712-5285

00750490US

\COM\482962.1